Results from the March 2011 National Flu Survey--United States, 2010-11 Influenza Season

The Advisory Committee on Immunization Practices (ACIP) now recommends influenza vaccination for all persons 6 months of age and older who do not have a contraindication to vaccination (1). To provide interim national and selected local area-level influenza vaccination coverage estimates as well as knowledge, attitudes and behaviors regarding influenza vaccines, the Centers for a Disease Control and Prevention (CDC) conducted the National Flu Survey (NFS) November 1 through 14, 2010 and March 3 through 30, 2011. This report is based on interview data from the March 2011 National Flu Survey, and provides an update to previously published results from the November NFS. State-level and national influenza vaccination coverage estimates for adults are available from the Behavioral Risk Factor Surveillance System (BRFSS) and for children from the National Immunization Survey (NIS) Child (6 months – 17 years) Influenza Module (CDC - Seasonal Influenza (Flu) - 2010-11 Monthly Vaccination Coverage).

Key Findings

- By approximately mid-March 2011, an estimated 42.3% (95% confidence interval [CI] half-width ±3.0) of persons 6 months of age and older, 46.2% (± 6.9) of children, and 41.1% (± 3.1) of adults had already received influenza vaccination (Table 1).
- Influenza vaccination coverage varied by local area for both children (range: 40.0% to 66.2%) and adults (range: 34.2% to 52.7 %) (Table 2).
- The most common place of vaccination among both adults (31.6% ± 3.8) and children (68.6% ± 8.0) was a doctor's office. Other common places of influenza vaccination reported for adults included pharmacies, supermarkets or other stores (21.2%), and workplace (14.2% ± 3.2). The most common nonmedical place of influenza vaccination for children was at school (5.6% ±4.2) (Figure 1).
- Most adults thought the influenza vaccination was very safe (48.6% ± 3.3) or somewhat safe (33.6 ± 3.1) and most were not at all worried (48.6 ± 3.3) or not too worried (25.6 ± 3.0) about getting sick from the influenza vaccine. Most adults thought the influenza vaccine was either very effective (38.5 ± 3.1) or somewhat effective (32.8 ± 3.2) in preventing the flu this season (Table 3).
- Persons who had been vaccinated this season were more likely to think the influenza vaccination was very safe (73.6 ± 3.7) compared to unvaccinated persons (30.7 ± 4.4). The majority of adults who were vaccinated (70.3± 4.2) thought the influenza vaccine was very useful for protecting them from getting the flu compared to unvaccinated adults (24.6% ± 4.3).
- For all persons 6 months of age and older, no significant racial/ethnic disparities in influenza vaccination coverage were observed among non-Hispanic whites (45.5% ± 3.4), non-Hispanic blacks (35.5% ± 11.8) and Hispanics (37.7% ± 8.1). Influenza

vaccination coverage was statistically lower among non-Hispanic other/multiple races (32.9 % ± 9.0) compared to non-Hispanic whites.

Table 1. Estimated influenza vaccination coverage among all children and adults, by selected age groups and race/ethnicity, United States, National Flu Survey, March 2011

	Un-weighted sample size	Influenza vaccination coverage	
	No.	%	95% CI*
All	38,113	42.3	± 3.0
By age -groups			
Children 6m-17 years	6,871	46.2	± 6.9
6m – 4 years	1,605	60.9†	± 13.5
5 – 12 years	2,926	46.9†	± 10.5
13-17 years	2,340	32.1†	± 10.9
Adults ≥18 years	31,242	41.1	± 3.1
18-49 years, HR§	2,098	35.4†	± 10.6
18-49 years, non-HR	9,056	26.0	± 4.7
18-49 years, HR unknown	855	36.9†	± 14.8
50-64 years	10,445	47.7	± 5.6
65+ years	8,788	74.7	± 4.8
By race/ethnicity:			
Hispanic	4,695	37.7	± 8.1
Non-Hispanic, White only	25,839	45.5	± 3.4
Non-Hispanic, Black only	4,908	35.5†	± 11.8
Non-Hispanic, Other or multiple race	2,671	32.9	± 9.0

* Percentages are weighted to the U.S. population; confidence interval half-width
† Estimate may not be reliable, confidence interval half-width >10.0
§ High risk includes asthma, other lung problems, diabetes, heart disease, kidney problems, anemia, weakened immune system caused by a chronic illness or by medicines taken for a chronic illness.

Table 2. Influenza vaccination coverage among children and adults, national and 20 local areas,* National Flu Survey, March 2011

	Children (6 months to 17 years)	Adults (18 years or older)
	Coverage % ± 95% CI	Coverage % ± 95% CI
National	46.2 ± 6.9	41.1± 3.1
Selected counties,† AR	62.7 ± 7.4	45.6 ± 3.5
Maricopa County, AZ	48.3 ± 8.5	38.0 ± 3.8
Fresno County, CA	52.2 ± 7.4	40.0 ± 3.6
Los Angeles County, CA	40.0 ± 9.8	35.1 ± 4.2
Selected counties,§ CO	63.3 ± 7.5	47.6 ± 3.9
Selected counties,¶ CT	57.9 ± 8.1	48.8 ± 3.9
District of Columbia	56.7 ± 10.0	47.9 ± 4.7
Selected counties,** GA	47.0 ± 9.6	36.3 ± 4.1
Chicago, IL	56.5 ± 8.0	39.2 ± 4.2
Cumberland County, ME	63.1 ± 6.8	52.7 ± 3.5
Washtenaw County, MI	63.6 ± 7.3	46.2 ± 6.1
Selected counties,†† MN	59.5 ± 6.8	49.4 ± 4.1
Selected counties,§§ NH	61.3 ± 6.8	52.5 ± 3.7
Selected counties,¶¶ NM	62.9 ± 8.5	45.7 ± 3.9
New York City, NY	64.8 ± 7.5	42.6 ± 4.0
Philadelphia, PA	62.3 ± 10.3*	48.8 ± 4.8
Davidson County, TN	66.2 ± 7.8	42.4 ± 3.5
Bexar County, TX	54.3 ± 9.5	42.1 ± 4.2
Houston, TX	65.7 ± 9.5	34.2 ± 4.2
Seattle, WA	52.3 ± 10.3*	41.9 ± 4.7

* n~1,400 per local area surveyed

† Arkansas, Ashley, Bradley, Chicot, Cleveland, Desha, Drew, Jefferson, Lee, Lincoln, Monroe, Phillips, Prairie, and St. Francis counties

§ Denver, Jefferson, Adams, Arapahoe, and Douglas counties

¶ New Haven, Hartford, and Middlesex counties

** Gwinnett and Fulton counties

†† Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, and Washington counties

§§ Belknap, Coos, and Grafton counties

¶¶ Sandoval, Santa Fe, Bernalillo, and Valencia counties

* Estimate may not be reliable because the confidence interval half-width >10.0.

Figure 1. Place of vaccination, children and adults, National Flu Survey interviews conducted March 3 through March 30, 2011, United States

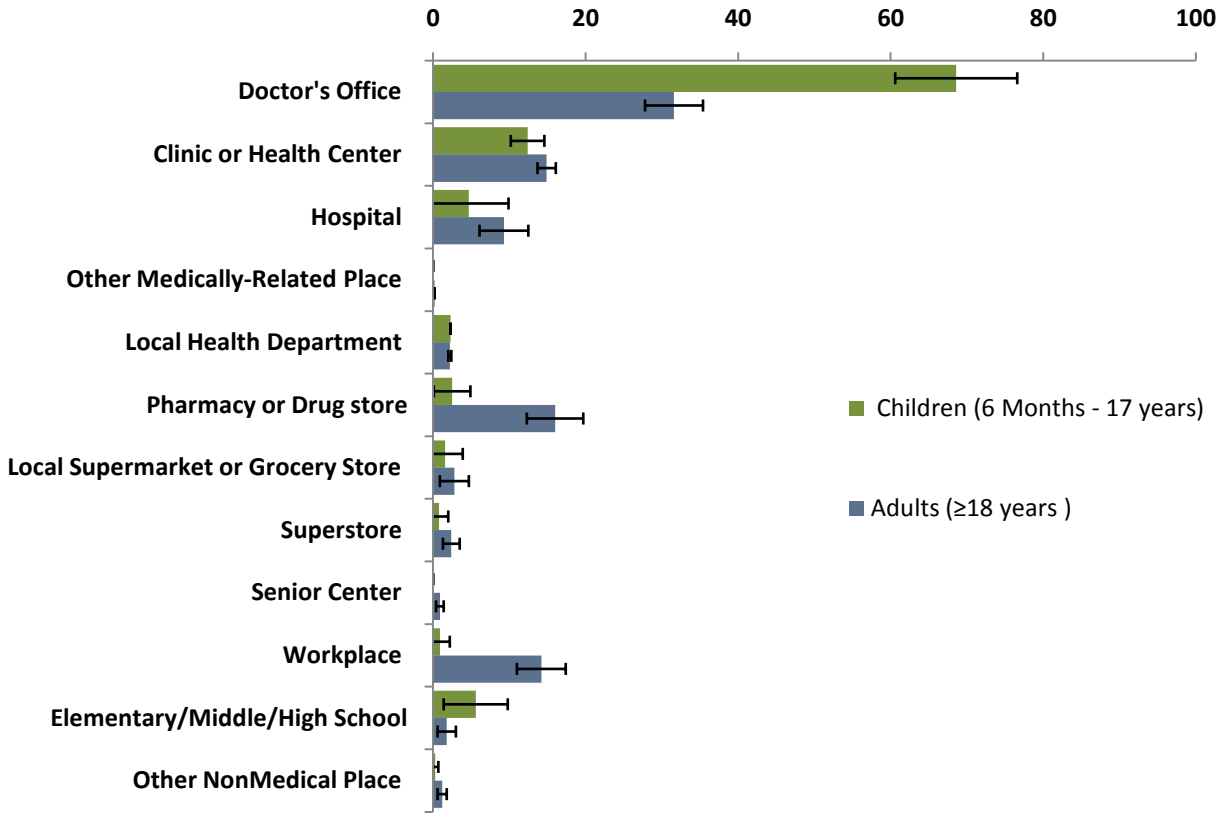


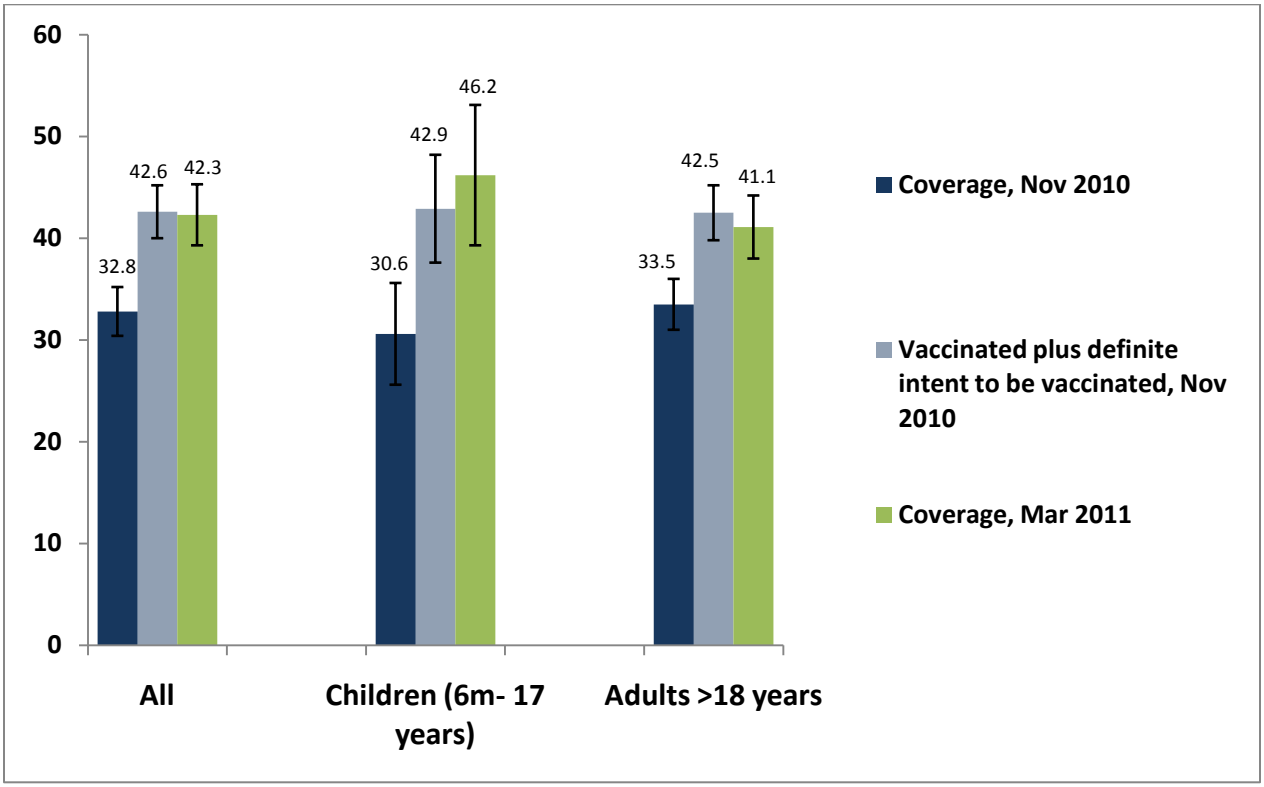
Table 3. Adults opinions about influenza vaccination and disease, 2010-11 influenza season, March 2011 National Flu Survey, United States

Belief Question	% ± 95% CI*	% ± 95% CI	% ± 95% CI	% ± 95% CI
How effective do you think the flu vaccination is in preventing the flu this season?†	Very Effective	Somewhat Effective	Not too Effective	Not At all Effective
	38.5 ± 3.1	32.8 ± 3.2	8.2 ± 1.8	7.8 ± 1.8
How worried are you about getting sick from the flu vaccine?	Very Worried	Somewhat Worried	Not Too Worried	Not at All Worried
	6.9 ± 1.9	17.7 ± 2.5	25.6 ± 3.0	48.6 ± 3.3
How safe do you think the flu vaccine is?	Very Safe	Somewhat Safe	Somewhat Unsafe	Very Unsafe
	48.6 ± 3.3	33.6 ± 3.1	10.0 ± 2.1	3.8 ± 1.6

* Percentages are weighted to the U.S. population; confidence Interval half-width

† 12.3% responded they did not know how effective they thought the flu vaccination was.

Figure 2. Comparison of influenza vaccination coverage estimates from the November 2010 and March 2011 National Flu Survey, United States



Summary and Public Health Implications

Findings from the March 2011 National Flu Survey presented in this report show an overall increase (~10 percentage points) in vaccination coverage among the US population compared to results from the November 2010 survey. As observed in the 2009-10 influenza season (CDC unpublished data), projected vaccination coverage based on reported definite intent to get vaccinated from the November 2010 NFS was similar to vaccination coverage estimates from the March 2011 NFS (Figure 2).

The 2010-11 influenza season is the first season for which influenza vaccination is recommended for all persons 6 months of age and older. The 2010-11 influenza vaccine protects against influenza A (H3N2), influenza B, and 2009 influenza A (H1N1) viruses. Most viruses in circulation this season have been antigenically similar to strains included in the 2010--11 vaccine (3). With an estimated 42.3% (95% CI 39.3-45.3%) of persons vaccinated by mid-March 2011, coverage this season is similar to the trivalent seasonal influenza vaccination coverage attained by the end of May 2010 in the 2009-10 influenza season (41.2% 95% CI 40.8-41.6%). http://www.cdc.gov/flu/professionals/vaccination/coverage_0910estimates.htm.

Opinions about the efficacy and safety of this season's vaccine were favorable. As observed in the November survey, influenza vaccinations were offered in many locations; however, the most common place of vaccination for both adults and children was the doctor's office. Other common places of vaccination were pharmacies and workplaces (for adults) and schools (for children). No significant racial/ethnic disparities were observed among non-Hispanic whites, non-Hispanic blacks and Hispanics in this survey; however, the ability of this survey to detect significant differences in coverage by race/ethnicity was limited. In the 2009-10 season, influenza vaccination coverage was significantly lower among non-Hispanic blacks (33.7% 95% CI 32.5-34.9) and Hispanics (33.6% 95% CI 32.4-34.8) compared to non-Hispanic whites (43.9% 95% CI 43.5-44.3) (4). Further analyses of racial/ethnic differences in influenza vaccination coverage will be conducted using data from the BRFSS and the NIS Child Influenza Module.

Vaccination is the single most effective strategy for protection from influenza virus infection and its complications. From October through early December 2010, influenza activity remained low in most regions of the United States. Activity increased beginning in mid-December 2010 and continued to increase through early February 2011(3). Although peak influenza activity in the United States most commonly occurs in February; substantial activity can occur as late as May (1). Influenza vaccination should continue to be offered to all unvaccinated persons 6 months of age and older throughout the influenza season.

Data Source and Methods

These estimates are based on data from the March 2011 National Flu Survey (NFS), a follow-up to the November 2010 NFS survey, conducted (by NORC at the University of Chicago) as part of a CDC-sponsored pilot project to rapidly collect influenza vaccination-related data. The purpose of the March survey was to provide timely influenza vaccination coverage estimates close to the season's end.

As was done for the November 2010 survey, 20 local areas[1] were selected based on various criteria.[2] An additional stratum of data collection was added that included all areas of the U.S. other than the 20 local areas. The study sample was a list-assisted random digit-dial (RDD) sample of both landline and cell telephones. Sample telephone numbers were selected to be representative of the 20 selected local areas in addition to a national sample. Sample selection was conducted separately for landline and cell telephone numbers. Cell telephone numbers were assigned to an area by the wire center where the telephone was activated.

Interviews for the March NFS were conducted March 3 through March 30, 2011. An advance letter was sent to landline households for which the telephone number could be matched to an address. The survey was conducted in English or Spanish. Households were eligible for participation in the survey based on the presence of a household member 18 years of age or older. Cell telephone respondents were surveyed if they were a "cell telephone only" household (i.e., they reported that they do not maintain a landline telephone in their household) or a "cell telephone mostly" household (i.e., they maintain a landline but make and receive most of their calls on a cell telephone), and they were 18 years of age or older. For the landline sample, the youngest male 18 years of age and older currently at home was selected for inclusion. If there were no males at home, the youngest female 18 years of age and older was selected for inclusion in the survey. For the cell telephone sample, the adult who answered the cell phone was asked about flu vaccinations. For interviews pertaining to children, the adult respondent was asked the ages of all children in the household younger than 18 years of age in both the landline and the cell telephone samples. One child was then randomly selected and the adult respondent was asked about the influenza vaccination status of that child. On average, four call attempts were made for each sampled number released to the telephone center.
The survey questionnaire included questions about: prior influenza season vaccination status, current influenza season vaccination status, and knowledge and behaviors related to influenza vaccinations. Demographic questions were included as were questions about medical conditions to ascertain the high-risk status for influenza-related complications.

The Council of American Survey Research Organizations (CASRO) response rate for the March NFS was 35.5% for landlines and 19.3% for cell phones. All estimates were weighted with weights derived based upon the probability of selection of the telephone number, incorporating adjustments for non-response at the telephone number resolution and household screening stages,

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[1] The areas included were: Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, and Washington counties, MN; Sandoval, Santa Fe, Bernalillo, and Valencia counties, NM; Seattle, WA; Washtenaw County, MI; Philadelphia, PA; Davidson County, TN; Bexar County, TX ; Denver, Jefferson, Adams, Arapahoe, and Douglas counties, CO; New Haven, Hartford, and Middlesex counties, CT; Gwinnett and Fulton counties, GA; District of Columbia; Chicago, IL; New York City, NY; Cumberland County, ME; Belknap, Coos, and Grafton counties, NH; Arkansas, Ashley, Bradley, Chicot, Cleveland, Desha, Drew, Jefferson, Lee, Lincoln, Monroe, Phillips, Prairie, and St. Francis counties, AR; Maricopa County, AZ; Los Angeles County, CA; Fresno County, CA; Houston, TX.

[2] Cities/local areas were chosen after evaluating several factors including: existing CDC funded programs related to influenza surveillance or influenza immunization, existence of school-located influenza vaccination clinics, ability to utilize the data provided to make in-season modifications of their influenza vaccination program, geographic location, and population size.

probability of selecting the adult/child of interest within the household, and for person non-response. The data are also weighted using a ratio adjustment to population controls (age, sex, race/ethnicity, and geographic area).

The findings in this report are subject to at least three limitations. First, response rates for the NFS were low, and non-response bias can remain even after weighting adjustments to reflect the population subgroup distribution and non-response. Second, self–reported influenza vaccination status was not validated with medical records and is subject to recall bias. Third, although approximately 31,000 persons were surveyed, because of the 20-local-area sampling strategy, power to detect significant differences among certain groups was limited.

References:

(1) CDC. Prevention and control of influenza with vaccines: recommendations of the Advisory Committee on Immunization Practices (ACIP), 2010. *MMWR Recomm Rep* 2010; 59(RR-8):1-62.

(2) Setse R et al. Assessing influenza vaccination coverage during the 2010-11 season. Presentation at the 45th National Immunization Conference, March 31, 2011, Washington, DC.

(3) CDC. Update: influenza activity---United States, October 3, 2010--February 5, 2011. MMWR 2011;60(06):175-181

(4) CDC. Influenza Vaccination Coverage — United States, 2000–2010, MMWR Morb Mortal Wkly Rep Suppl.2011;60: 35-41.